

User Manual for Matrix Maker

Version 3.2

I. Program Installation

To install the program, run the Setup.exe file.

The default folder for installation is

“C:\Program Files\Matrix Maker\Programmable Keyboard”.

II. PS/2 Keyboard and MSR Card Reader Driver Setup

This section is only for Windows 2000 and Windows XP® users who have PS/2 keyboard or MSR card reader. The default folder for the driver files is “C:\Program Files\Matrix Maker\KB Driver”. For the detailed instructions, please refer to the file, POSKB_DRV_SETUP.pdf, which is in the default folder.

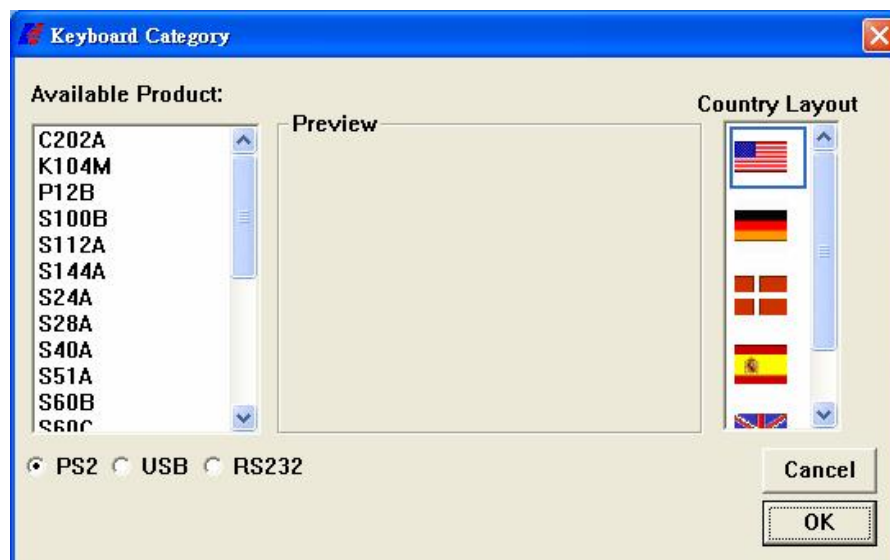
III. Keyboard Programming Software

The default location of executable file is

“C:\Program Files\Matrix Maker\Programmable Keyboard\MatrixMaker.exe”

1. Select a keyboard

When the program runs, the Keyboard Category dialogue will appear.



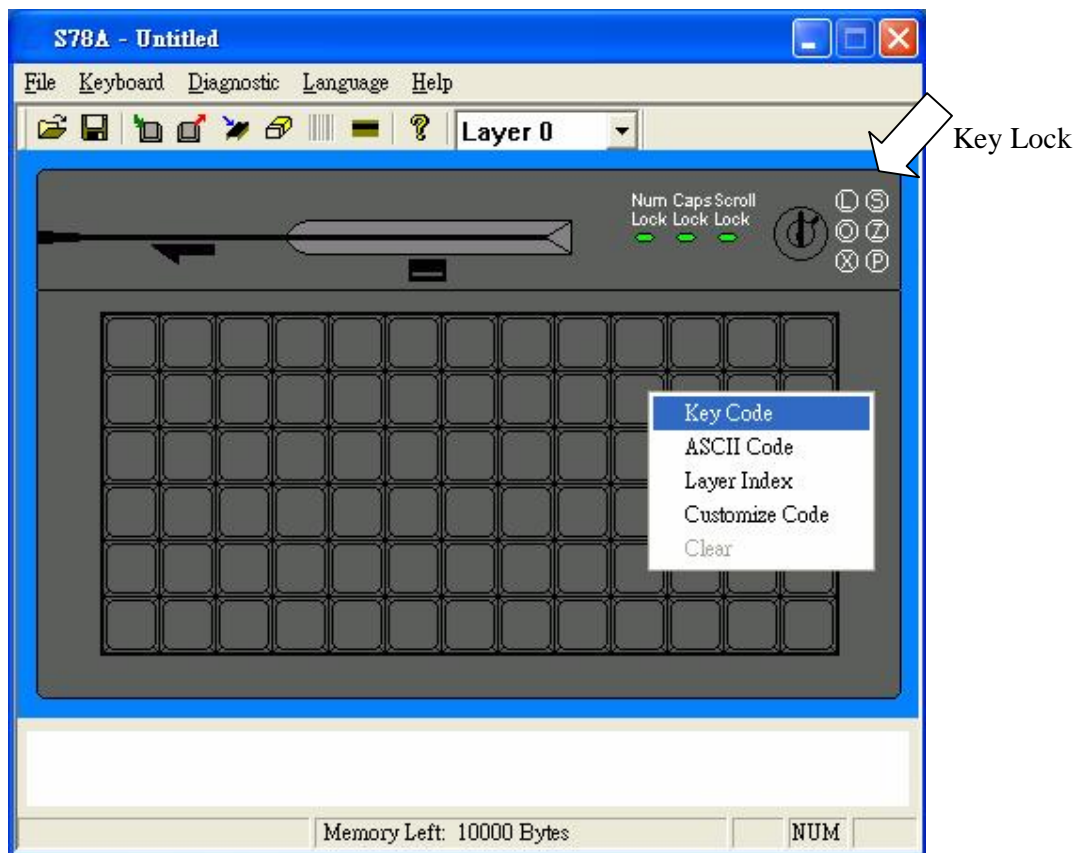
Select the category of the keyboard and the country layout you want to program, and then press OK button. The following instructions are based on S78A model, but they can also be applied for other models.

2. Edit Key Map

(If a magnetic card reader is selected in the Keyboard Category dialogue, you can treat Header, Separator, and Suffix as buttons in the keyboard and program them by 'Key Code' and 'ASCII code' methods. For details, please refer to the Section 4.)

A button in the keyboard layout changing dark grey when the mouse cursor is on top of it indicates that the button can be programmable.

Click the left mouse button on that programmable button, a popup menu appears. There are totally three methods to assign the key map. One method is called 'Key Code', one is 'ASCII Code' and the other is 'Customize Code'. After assigning codes for a button, you can choose 'Clear' in the popup menu to clear the codes. Choose "Layer Index" to assign a layer index to a key.

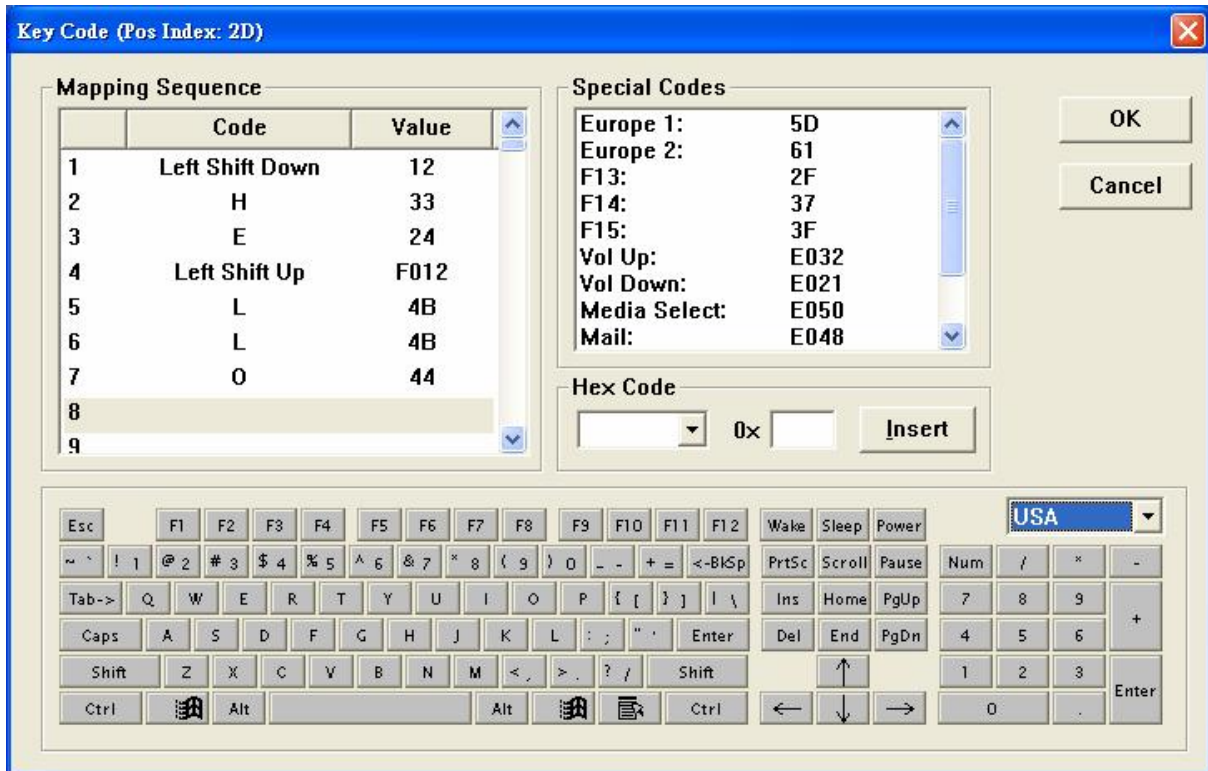


Note:

Not all models have Key Lock.

i. Key Code

In this method, you can assign any scan codes to a key.



In the above dialogue window, most popular key codes (scan codes) are shown in the “virtual keyboard” area, plus a few special codes which are listed in the “Special Codes” area. Selecting a key from the “keyboard” area or double clicking an item in “Special Codes” area will add that key’s code to the “Mapping Sequence” list. Up to 256 codes can be mapped to a single key position.

Any key codes (scan codes) that are not selectable in this screen can be mapped by directly entering the hexadecimal code for that key into the box next to “0x” and pressing “Insert”.

Example

If you press “Shift”, “H”, “E”, “Shift”, “L”, “L”, and “O” buttons in the “virtual keyboard”, the “Mapping Sequence” list will be shown as in the above dialogue window. If you want to delete “O” in the above “Mapping Sequence” list, you can right click the “O” item. A popup menu with two options will appear. Select “Delete” option will delete the “O” item. But if you select “Clear All”, all items in the list will be deleted.

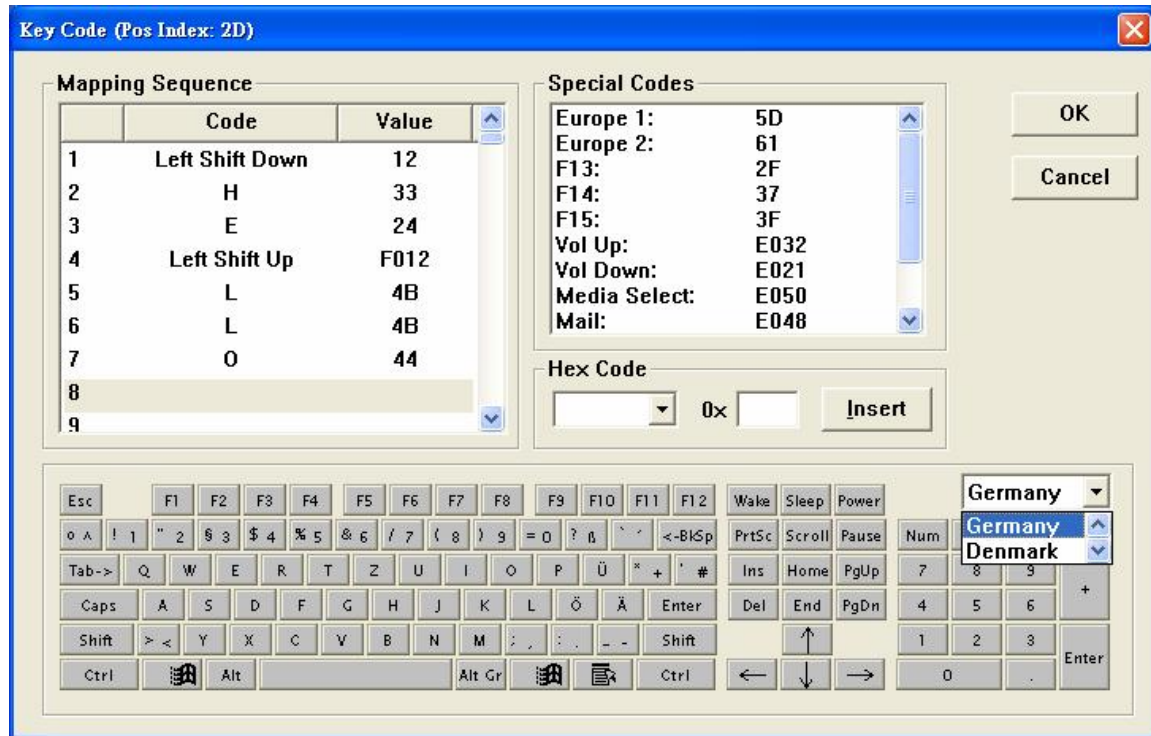
If you want to add “S” before “H” in the above “Mapping Sequence” list, click “H” item in the list first, then press “S” in the “keyboard” picture. But remember to click any empty items in the list if you want to append the codes at the end of the list.

After programming this key, if you type this button in Notepad, it will display “Hello” if the Caps Lock is off. However, it will display “heLLO” if the Caps Lock is on.

Caution:

1. If, for example, you want to assign Left Shift code (no any other codes), you just press left Shift button once in the “keyboard” picture. But, in the “Mapping Sequence” list of the above dialogue window, if you press left Shift button once (i.e. there will be no Left Shift Up code in the “Mapping Sequence” list), when you press this button after programming, it seems that the left Shift button is still pressing continuously. The above situation is also applied for Right Shift code, Left Alt Code, Right Alt Code, Left Ctrl Code, and Right Ctrl Code. Therefore, much attention is needed when assigning these codes.
2. For PS2 interface, if <Pause> code is assigned, no other codes can be appended. On the other hand, if other code is assigned, the <Pause> code cannot be appended.
3. For USB interface, the following codes cannot be assigned with other codes:
<Wake>, <Sleep>, <Power>, <Vol Up>, <Vol Down>, <Media Select>, <Mail>, <Calculator>, <My Computer>, <WWW Search>. On the other hand, if other code is assigned, the above codes cannot be appended.

Depending on the version of the software, you can change the virtual keyboard layout by selecting the country you like.

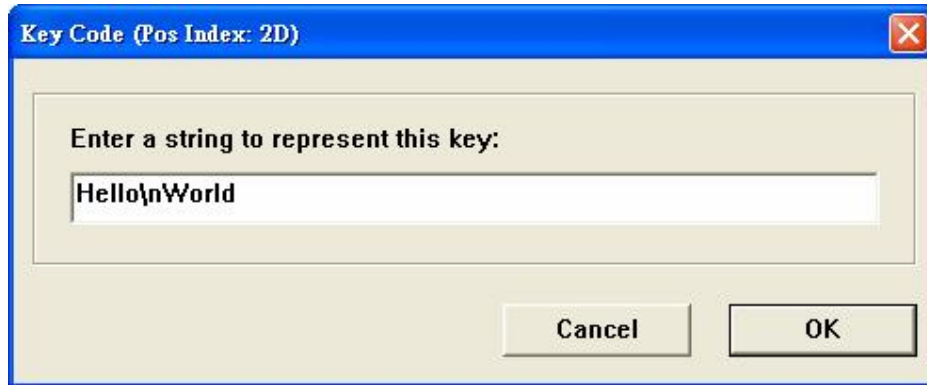


ii. ASCII Code

In this method, you can assign any printable ASCII Codes, i.e. A-Z, a-z, 0-9, +, -, *, /, and punctuation symbols. Up to 255 ASCII codes can be assigned. Five special symbols can also be assigned by using the following representations:

Symbol	Representation
Enter Character	\n or \N
Esc Character	\e or \E
Tab Character	\t or \T
\ Character	\\
Delay 0.5 second	\d or \D
ASCII Code	\xHH where HH must be a two-digit hexadecimal integer

For example, if you program a button with Hello\nWorld, as shown in the following diagram,



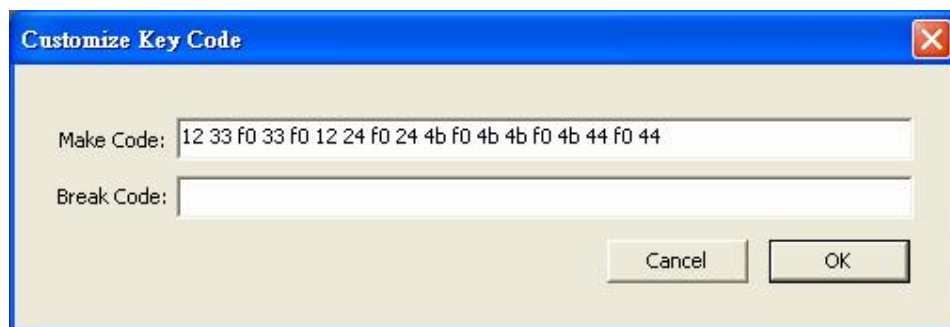
After programming this button, if you type this button in Notepad, it will display,
Hello
World

Note:

1. By using this method, no matter you press Caps Lock or not, it will always display the same character string.
2. The output of the character string is the same as what you enter if you choose a correct Country Code in the Keyboard Setting dialogue (Refer to Section 3).
For example, if you enter "How are you?" in a Germany OS, but you choose USA for the Country Code in the Keyboard Setting dialogue, the output will become "How are zou?".

iii. Customize Code (For PS/2 keyboard only)

This method allows a user to directly assign PS/2 Set 2 Scan Codes for the key.



The codes entered in the "Make Code" field will be sent if the key is pressed down while the codes entered in the "Break Code" field will be sent when the key is pressed up. For example, the codes in the above diagram are the Scan Codes for left shift's make code(12), h's make code(33), h's break code(f0 33), left shift's break

code(f0 12), e's make code(24), e's break code(f0 24), l's make code(4b), l's break code(f0 4b), o's make code(44) and o's break code(f0 44).

Note:

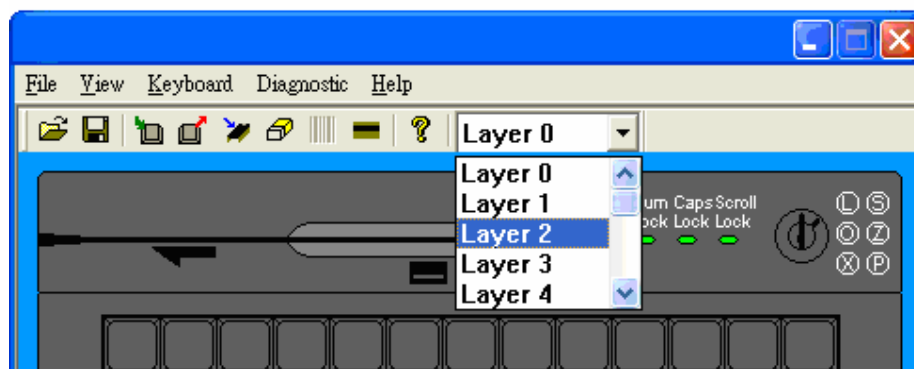
1. Please enter the codes in hexadecimal format and use space to separate the codes.
2. Each code should have at most 2 characters (0-9, A-F or a-f).
3. There are 2 codes you cannot use to assign. They are 00 and 02.

iv. Layer Index

Depending on the category of the keyboard, it is allowed to program the keyboard at most 16 layers. You can assign a layer index to any key you like.

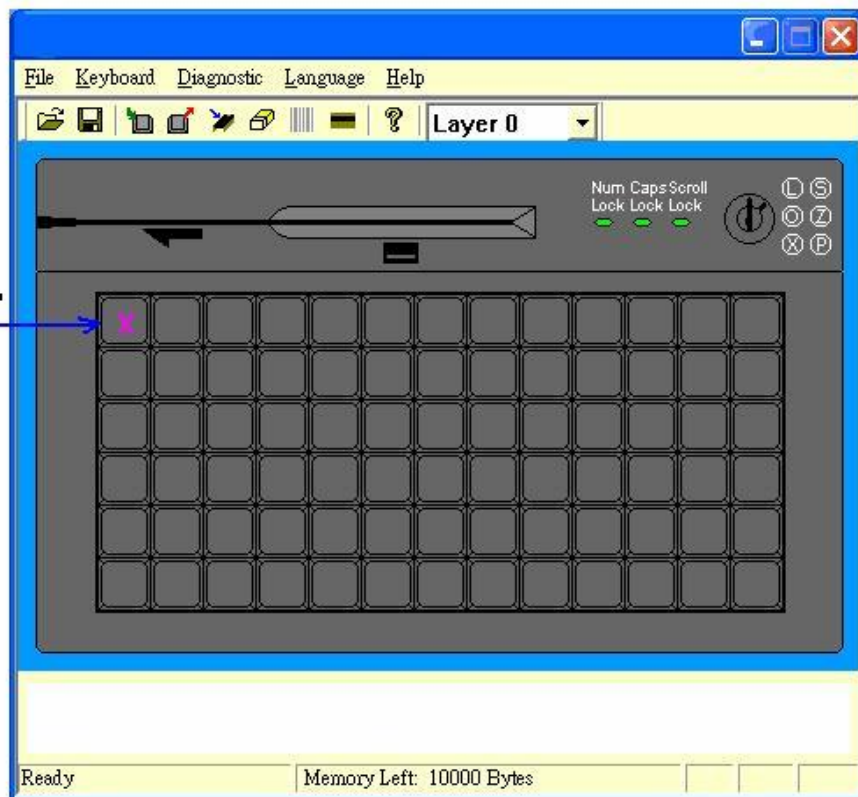


If, for example, you want to program the keyboard at the 2nd layer, you can choose Layer 2 option in the tool bar. Then assign the key codes by Key Code option, ASCII Code or Customize Code option. However, if you do not program a key to the layer index 2, there will be no response for those keys you assigned at the 2nd layer.

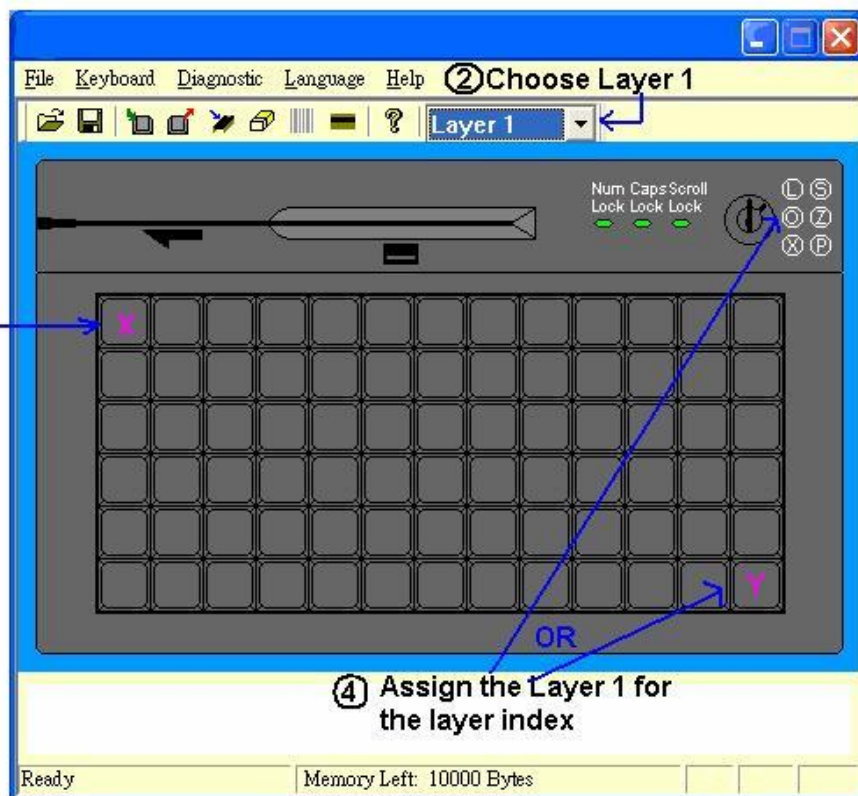


The following shows, for example, an instruction how to use layer programming.

①
Assign the
codes as "hi"



③
Assign the
codes as
"bye"



After programming this key map, if you press the X button in the keyboard, it will display “hi”. If you change the key lock to the position OP (or pressing the Y button without releasing), it will display “bye” if you press the X button.

3. Keyboard Setting

(This setting will not be provided if a RS232 magnetic card reader is selected in the Keyboard Category dialogue. If a PS2 or USB magnetic card reader is selected, only “Country Code” setting is meaningful.)

On the menu bar, click ‘Keyboard’ and then ‘Keyboard Setting’, the following dialogue window will appear,



Note:

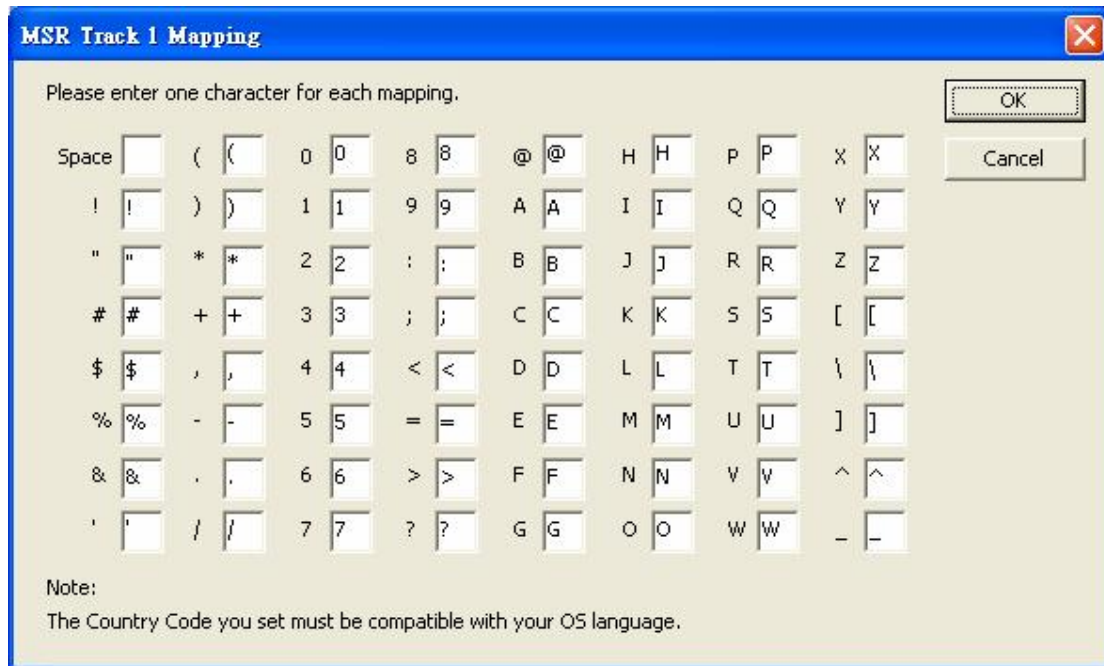
The button “MSR Track 1 Mapping” is invisible for all PS2 and RS232 devices.

If you want to have a beep sound when pressing a button on the keyboard, click ‘Beep Enable’ option. Then you can choose either ‘All Keys’ or ‘Only Programmed Keys’ option.

If you allow the key to be displayed repeatedly when pressing the button continuously, click ‘Repeat Enable’ option.

Depending on what type of keyboard chosen, you can assign a country code in the keyboard setting. This country code will affect what the magstripe card reader reads and the keys programmed by the ASCII code method.

For a USB device with MSR function, you can change the default mapping for MSR Track 1 Data by pressing the button “MSR Track 1 Mapping”.



Note:


To display the mapping correctly in your PC, you should choose the Country Code in the Keyboard Setting dialogue window compatible with your OS language.

After finish the settings you like, you can press 'Update' button to send these settings to the keyboard and then the dialogue window will be automatically closed. Or you can press 'OK' button to save the setting in the program memory and then the dialogue window will be automatically closed.

Caution:

If you choose 'Repeat Enable' option and you assign non layer index for certain key lock position, for example, assigning "Hello" for key lock L. When the key is switched on L position, "Hello" will be generated repeatedly. If you choose 'Beep Enable' at the same time, you will hear a continuous beep sound. Therefore, it is recommended the key lock be assigned a layer index.

4. Magstripe Card Reader Setting (Optional)

On the menu bar, click 'Keyboard' and then 'Magstripe Card Reader Setting', or on the toolbar, click  icon, the following dialogue window will appear,

Magstripe Card Reader Setting

Start Sentinel

Track 1 ☒ %

Track 2 ☒ ;

Track 3 ☒ ;

☒ Enable Beep

End Sentinel

?

?

?

Reading Sequence: 1-2-3

Options <Some devices may not be supported>

☐ Detect IBM card

☐ NCR OPOS format

☐ Reverse reading

☐ Output data for any valid track

☐ Output credit card A/C No.

☐ Enable LRC

☐ Shown in digital format

Others

Header:

☐ ASCII ☐ Code

Separator:

☐ ASCII ☐ Code

Suffix:

☐ ASCII ☒ Code

Update

OK

Header, Separator, and Suffix can be programmed similar to normal buttons on the keyboard, click on the ASCII or Code to bring up the window for input.

Options

The following settings are not supported by all devices. You can make a request to us if you find that your device does not support these settings.

1. *Detect IBM card*

Some IBM cards have special formats. If you want to read the card correctly, you may try to select this option.

2. *NCR OPOS format*

It can be used in NCR system with MSR. It adds some special codes for each sentinel.

3. *Reverse reading*

The track data will be read from right to left, instead of from left to right. It is suitable for some languages, e.g. Hebrew.

4. *Output data for any valid track*

If there is an invalid track in the card, it still can display the remaining valid tracks.

5. *Output credit card A/C No.*

It can display the credit card A/C No. only for track 2.

6. *Enable LRC*

It can display the LRC after then end sentinel for each track.

7. *Shown in digital format*

If it is checked, the LRC will be displayed in the 2-byte digital format. If it is unchecked, the LRC will be displayed in the character format. For example, if the LRC in Track 1 is 0x31, it will display “31” when it is checked and it will display “Q” when it is unchecked.

Note:


1. The code length for Header, Separator, and Suffix are limited to 16 only.
2. For all RS232 devices, you can only enter 1 character for each sentinel. If you enter more than 1 character, the software will discard all characters.
3. For some PS/2 and USB devices, you can enter not more than 16 characters for each sentinel. You can use \n to represent the new line character in each sentinel.
4. For a RS232 device, they can only be programmed by using ASCII method.

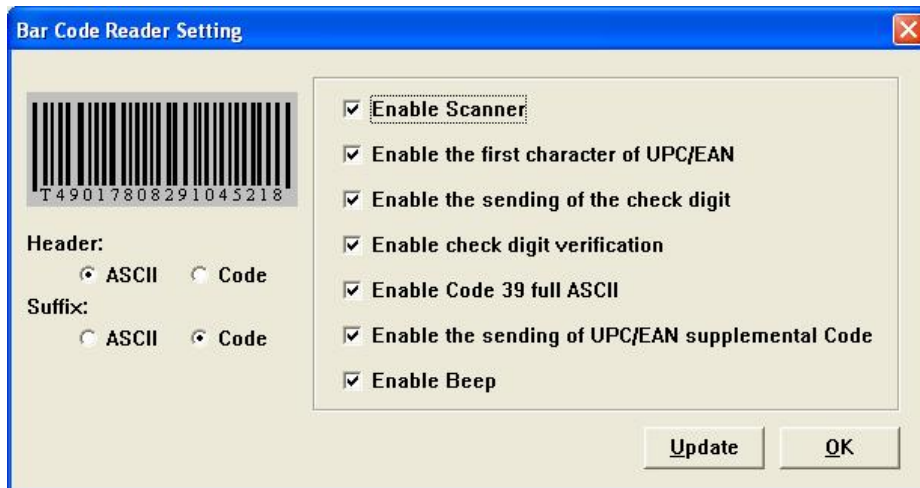
According to the settings in the above dialogue window, after you sliding a magstripe card along the reader, it will display as follows,

Header codes, Track 1 Start Sentinel, Track 1 Data, Track 1 End Sentinel, Separator codes, Track 2 Start Sentinel, Track 2 Data, Track 2 End Sentinel, Separator codes, Track 3 Start Sentinel, Track 3 Data, Track 3 End Sentinel, Suffix codes.

After finish the settings you like, you can press ‘Update’ button to send these settings to the keyboard and then the dialogue window will be automatically closed. Or you can press ‘OK’ button to save the setting in the program memory and then the dialogue window will be automatically closed.

5. **Bar Code Reader Setting (Optional)**

On the menu bar, click ‘Keyboard’ and then ‘Bar Code Reader Setting’, or on the toolbar, click  icon, the following dialogue window will appear,



Header and Suffixes can be programmed similar to normal buttons on the keyboard, click on the ASCII or Code to bring up the window for input.

After finish the settings you like, you can press 'Update' button to send these settings to the keyboard and then the dialogue window will be automatically closed. Or you can press 'OK' button to save the setting in the program memory and then the dialogue window will be automatically closed.

6. Firmware Update (Except for the USB device)

On the menu bar, click 'Keyboard' and then 'Update Firmware', or on the toolbar, click



icon, it will ask you the location of the firmware file.

During updating, please do not press any keys on the keyboard for better performance.

7. Diagnostic

i. Enter Test Mode

The key pressed will show its key position. (For testing the keyboard only.) If your keyboard has key lock and the repeat feature is turned on, the keyboard will continuously send the key lock position. To stop this, you can press any other key.

ii. Exit Test Mode

The key pressed will show the code programmed.

iii. Load Factory Setting

Re-load the default factory setting to the device. This function can be used when the QUERTY section of the keymap is lost. For the USB keyboard, please re-plug

the keyboard and close the software after executing this function successfully.

iv. Reset

Reset the keyboard only. (For testing the keyboard only.)

v. Ignore the middle device (For PS/2 device)

In case two of our PS/2 devices are connected by loop-through, you can directly program the device which is connected to the PS/2 port of your PC. But if you want to program the 2nd device, you need to ignore the middle device (i.e. the one which is connected to the PS/2 port of your PC) first.

Note: Once the middle device is ignored, it will be disabled.

vi. Restore the middle device (For PS/2 device)

To enable the middle device, you need to restore it first.

vii. Firmware Version

Get the current version of the firmware.

viii. MCU Type (Disabled)

Get the type of the MCU being used by the device.

8. Update Key Mappings

After you assigning the codes for all or some of the buttons, you can start to program the key mappings in the following manners.

On the menu bar, click 'Keyboard' and then 'Update Key Mappings', or on the toolbar,

click  icon.

During updating, please do not press any keys on the keyboard for better performance.

9. Update Whole Keyboard

After you assigning the codes for all or some of the buttons, configuring keyboard setting magstripe card reader setting, and barcode reader setting, you can click 'Keyboard' on the menu bar and then 'Update Whole Keyboard'.

During updating, please do not press any keys on the keyboard for better performance.

10. Retrieve Keyboard


If you want to get the key code programmed in each key, keyboard setting or magstripe

card reader setting, you can click 'Keyboard' on the menu bar and then 'Retrieve

Keyboard' or click  icon on the toolbar.


During retrieving, please do not press any keys on the keyboard for better performance.

11. Clear All


If you want to clear all key mappings, the keyboard setting or the magstripe card reader setting, click 'Keyboard' on the menu bar and then 'Clear All' or click  icon on the toolbar.

This action only clears the program memory. It does not clear all settings in the actual keyboard.

12. Save

If you want to save all key mappings, the keyboard setting or the magstripe card reader setting into a file, click 'File' on the menu bar and then 'Save' or click  icon on the toolbar.

13. Open

You can load the key mappings, keyboard setting or magstripe card reader setting from a file, click 'File' on the menu bar and then 'Open' or click  icon on the toolbar.

An error will occur if you choose to load a wrong format keymap file.

14. Default Keymap

You can set the default key mappings for each model by clicking 'File' on the menu bar and then 'Set default'. Once the keymap is set as default, it will be automatically loaded if you select this model next time.

IV. Batch Update

You can update the keymap or the firmware automatically by creating a batch file. After updating, the program will be closed automatically.

1. Keymap Update

The format of the batch file for updating keymap for a PS2 or USB device,

`"Location_of_Executable_File"-1"Location_of_Keymap_File"-t"Category"`

For example,

`"C:\Program Files\Matrix Maker\Programmable Keyboard\MatrixMaker.exe"
-1"C:\temp\s78a.dat"-t"S78A"`

The format of the batch file for updating keymap for a RS232 device,

`"Location_of_Executable_File"-1"Location_of_Keymap_File"-t"Category"`

`-s"Port,Baud"`

For example,

`"C:\Program Files\Matrix Maker\Programmable Keyboard\MatrixMaker.exe"
-1"C:\temp\C202AC.dat"-t"C202AC" -s"1,57600"`

2. Firmware Update (Except for the USB device)

The format of the batch file for updating firmware for a PS2 device,

`"Location_of_Executable_File"-2"Location_of_Firmware_File"-t"Category"`

For example,

`"C:\Program Files\Matrix Maker\Programmable Keyboard\MatrixMaker.exe"
-2"C:\temp\poskb.bin"-t"S78A"`

The format of the batch file for updating firmware for a RS232 device,

`"Location_of_Executable_File"-2"Location_of_Firmware_File"-t"Category"`

`-s"Port,Baud"`

For example,

`"C:\Program Files\Matrix Maker\Programmable Keyboard\MatrixMaker.exe"
-2"C:\temp\poskb.bin"-t"C202AC" -s"1,57600"`

Note:

- a. There is a space before -1, -2, -t, and -s but no space after -1, -2, -t and -s.
- b. The double quotation mark is required.